YL — 8□ Series Intelligent Temperature Controller (ITC)

ITC User Guide

★ Please read carefully this entire User Guide before operating ITC. Keep this guide for future references。

1. Product Descriptions

The YL-8 Series is designed and manufactured strictly based on European CE standards, and has gone through five rigorous tests including testing in extreme temperatures (-20℃ to 75℃), testing in various work loads and conditions, and testing using specialized instruments. These tests are designed to ensure the ITC is accurate, reliable and durable in various applications under normal and special working conditions.

YL-8 Series employs advanced expert fuzzy technology and Dual Control Logics. Its built-in auto-calibration intelligence ensures that ITC's performance is accurate, reliable and durable, and can track, lock, revise and react quickly to temperature changes. The built-in auto-calibration intelligence is particularly useful for special temperature control applications, e.g., operating multiple equipments with different temperature requirements each and the resulted heat interference, or, having specific requirements on temperature control related to factors such as heating and cooling capacity and ambiance temperatures. In these special applications, users can easily and quickly obtain a custom set of P, I, D values for their special applications, As a result, YL-8 Series ITC can be used in a wide range of applications. YL-8 Series is an excellent controller for machineries in food processing, glass-making, plastic forming, publishing, packaging, and metal processing. YL-8 Series is also the preferred temperature controller for processes such as temperature sensitive drying, metal heat-treatment, and chemical and mechanic treatments.

This series of products has got the European CE certificate.

Product Features:

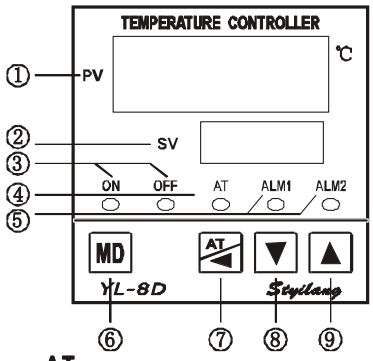
* If the value displayed on the temperature controller is below 1000°c(according to the types of sense-transferring line),0.1°c(or 1°c) can be chosen.
* The software has optimized,and the precision is below ±1°c .
* The circuit of wide-width switching power,AC80-260V,is widely suitable to many kinds of voltage,good at resisting the interference of harmonic,and in good stability.In one word, it can meet all the requirements from different working environments.
* The producing technology of electronic-chips,SMC,is adopted by the electronic components, which generate less heat , in good stability while working,and has a long service life.
* Without entering the menu,the self-tuning function will be activated by keeping pressing the "AT" button for a while.
* Self-tuning AT is fast,stable and excellent.
* Multiple kinds of standard signal,thermocouple TC,thermal resistance RTD,analog quantity 4-20mA,0-5VDC and so on,are free to input,so as the measuring range.
* The cold side of sense-transferring line can test the temperature alone,and the deviation can be corrected.The amplifier of the cold side can return to zero by itself,the precision is ±2%FS.
* Main outputs:

"R"--Relay controlling AC contactor
"S"--Impulse zero triggering SSR
"I"--Current output 4-20 mA,impulse triggering Voltage-regulator
"U"--Voltage output 0-5 VDC,impulse triggering Voltage-regulator

* Two kinds of independent output for alarming,and twelve ways of alarming for upper-lower limit are free to combine.

2. ITC Technical Specifications

1) ITC Panel Layout



① "PV" window (in red):shows the actual temperature and various functions symbols

② "SV" window (in green):displays user's preset desired temperature, factory initial settings,and auto-calibrated parameters as well as user's preset parameters.

③ "ON" (green light on)indicates the output ports are open;"OFF" (green light go out) indicates the output port is closed.

④ "AT" light (yellow) flashes during ITC's auto-calibration process.

⑤ "ALM1","ALM2":Signal lights of two alarm channels (red),operating independently.

⑥ "MD":Mode selection key for: presetting, reviewing or confirming settings and parameters.

⑦ AT Activating auto-calibration; move the cursor left when setting calibration parameters.

⑧⑨ Decrease or increase the values to the desired parameters.

2) ITC Panel Display

①Normal display: After connecting to power, the "PV" window will show transmitter types, such as "K", and then current temperature; "SV" window shows "PID" and then preset desired temperature.

②Normally, the "PV" window may flash the following values

"HHHH" – input values are too high, or, incorrect settings on transmitter, or input disconnect; etc.

"LLLL" – input values are too low, or, incorrect settings on transmitter, connection error; or input short circuit; etc

"Erro"– Exchange parameter out of ranges, incorrect settings on transmitter, connection errors, short circuit in input source, or disconnect,etc.

Values displayed in the "PV" window are correct despite the "HHHH"and "LLLL" errors but the "PV" values are incorrect under the error message"Erro".

3.ITC Technical Specifications

1)Technical Specifications

Specs	Technical Parameter
Setting Accuracy	All ranges ±0.5% FS, within one degree
Measuring Accuracy	±0.2% FS, within one degree
Sampling Frequency	2 / Second
Input Signals	Standard inputs,all configurations : E,E1,K,K1,N,N1,J,J1,T,T1,S,R,B,Wer,Cu50,Pt100,0-5V,1-5V,0-10mA,0-20mA,4-2mA.
Temperature Control	Intelligent setting:factory Initial setting P,I,D. (1)Time proportional control:modify I=0,D=0. (2)Reach-stop control:modify P=0.
Output Control	Switch Control:"R" – Relay Contact, "S" – SSR zero triggering. Modeling Control: "I" – 0-10mA,4-20mA continuous; "U" – 0-5VDC, 1-5VDC continuous.
Relay Contact Load	250VAC / 3A (Resistance),250VAC / 1A (Conductive,Cosϕ=0.4)
Impulse Voltage Load	12VDC,Max 40mA (To drive SSR,to protect short circuit)
Model Current Voltage Load	(Standard) 0-5VDC,4-20mA,Load Resistance Max=500Ω
Alarming	12 kinds of upper-lower limit alarm on deviation and absolute level are free combination.
Alarm Output	Relay：250VAC / 3A(Resistive), 250VAC / 1A(Sensing，Cosϕ=0.4）
Power Consumption	80-260VAC, 50-60Hz, ≤5W
Insulation Resistant	≥10MΩ（Testing Condition 500VDC）(Outputting current or non-contactor voltage; no test for I/O ports and the resistance of CT input)
Ambiance Temperature	Temperature:-20~+75°c Humidity:35 ~85%RH

2) ITC Functions and Parameters

Symbol	Term	Ranges	Descriptions	Initial
AL1	Alarm Upper limit	-199~ 9999℃	Set alarm upper limit,and deviation of this limit over preset temperature value	50℃
AL2	Alarm Lower Limit	-199~ 9999℃	Set alarm lower limit,and deviation of this limit under preset temperature value.	0℃
Hy	Control Points	0~50 /5000℃	Interval control values or alarm ranges	0℃
Pb	Measurement Revision	-500~+500	Revise deviations from initial circuit input and from compensating thermal couple (resistor)	0℃
P	Scaling setting (Heating)	0.0~999.9℃	Set interval control, P=20℃ in general or 50℃ for powerful heater Set P=0 for point control.	20℃
I	Integral Time (Repetitive)	0~ 3600s	Mostly 60～240S. Increase I if temperature fluctuates regularly; decrease I for persistent deviations.	150s
D	Differential Time (Preset)	0.0~999.9s	Mostly 1/3～1/5. Increasing D lessens system's over-heat but weaken the anti-interference capability	30s
T	Control Cycle (Heating)	1~99 s	Set temperature control cycles."0" is unallowed. Relay output: 20 seconds; Logic level output drive SSR:2s; 0-5V,4-20mA phase shifting voltage regulating output:1s.	20s/2s /1s
AT	Auto-Calibration	0~1	"0"= Off;"1"=On (See Control Panel)	0
Lock	User Input Lock	0~2	"0":free to input;"1":input preset only;"2":locked	0

4) Advanced Parameter Settings

This intelligent series has advanced settings (Third level special parameters menu) for engineers or senior experienced users. Ordinary users had better not regulate the original parameters, in order to avoid confusing procedures.

Method of operation to enter third level menu is as follow:Press and hold both the"MD" and AT keys at the same time until "PASS" is shown in the SV window and "0000" is shown in the PV window.Then, release AT key after release "MD" key. Input "01000" in the SV window to enter the "menu code" as follow,thus you can reset or modify relevant parameters.Press "MD" key to confirm after set or modify parameters in order,then return to "PASS" and exit the menu. Please refer to the table below password and operate in order.

Codes	Symbol	Definition	Descriptions	Values/Ranges
13	**Sn**	Transmitter Models	"1"behind model=Precision 0.1℃(0-999.9℃). Eg."K"=1℃ (1-1300℃), "K"=0.1℃(0-999.9℃) Make changes over lines. Factory setting = Model "K1".	E,E1,K,K1,N,N1,J,J1, T,T1,S,R,B,Wer,Cu50 ,Pt100,0-5V,1-5V,0-10 mA,0-20mA,4-2mA.
14	**AL1P**	6 Kinds of Upper Limit Alarms Settings (A:Absolute value D:Offset value)	"0"=A(Basic function) "1"=D(Basic function) "4 "=External interval alarm(External alarm) "10"=A(With alarm removal function /Standby alarm) "11"=D(With alarm removal function /Standby alarm) "14"=External alarm(With alarm removal function/Standby alarm)	0,1,4,10,11,14 Factory Initial setting: 1

15	**AL2P**	6 Kinds of Lower Limit Alarms Settings (A:Absolute value D:Offset value)	"2"=A(Basic function) "3"=D(Basic function) "5 "=External interval alarm(External alarm) "12"=A(With alarm removal function /Standby alarm) "13"=D(With alarm removal function /Standby alarm) "15"=External alarm(With alarm removal function/Standby alarm)	2,3,5,12,13,15 Factory Initial setting: 12
16	**SETL**	Minimum Preset	Preset minimum value based on transmitters	Factory Initial setting: K1 0-999.9℃
17	**SETH**	Maximum Preset	Preset max value based on transmitters	
18	**OUT**	Output Control Signals	1.Rly:Output contacts signals drive AC contactor coil, or DC12V pulse voltage drive SSR 2.1-5V:Output 0-5 V continuous voltage drive voltage regulating module. 3.0-5V:Output 4-20 mA continuous current driver voltage regulating module.	Depends on the control mode.
19	**PSL**	Input Zero Value	Applicable when input linear signals (current or voltage, etc)	-1999~9999 Factory Initial setting:0 / 5000
20	**PSH**	Input Full Value		
21	**DP**	Decimal Points	Only for linear signal.	0~3. Factory Initial setting:1

4. Wire Connection Map

1)Special Notes

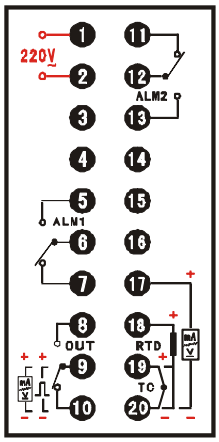
(1) Thermal couples input, use compensating wire with corresponding codes

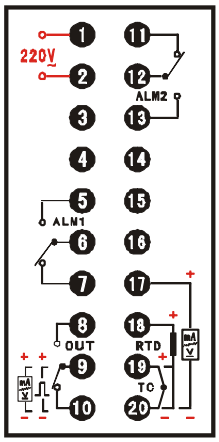
(2) Thermal resistor input, use three identical compensating wires with low resistant

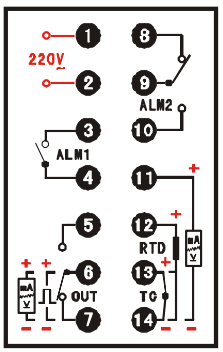
(3) Signal input wires should avoid magnetic interference from power lines electronic applicants.

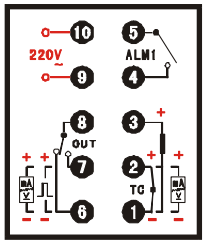
2)Wire Connection Layout

(1) YL-8A (2) YL –8B (3) YL–8D (4) YL–8E







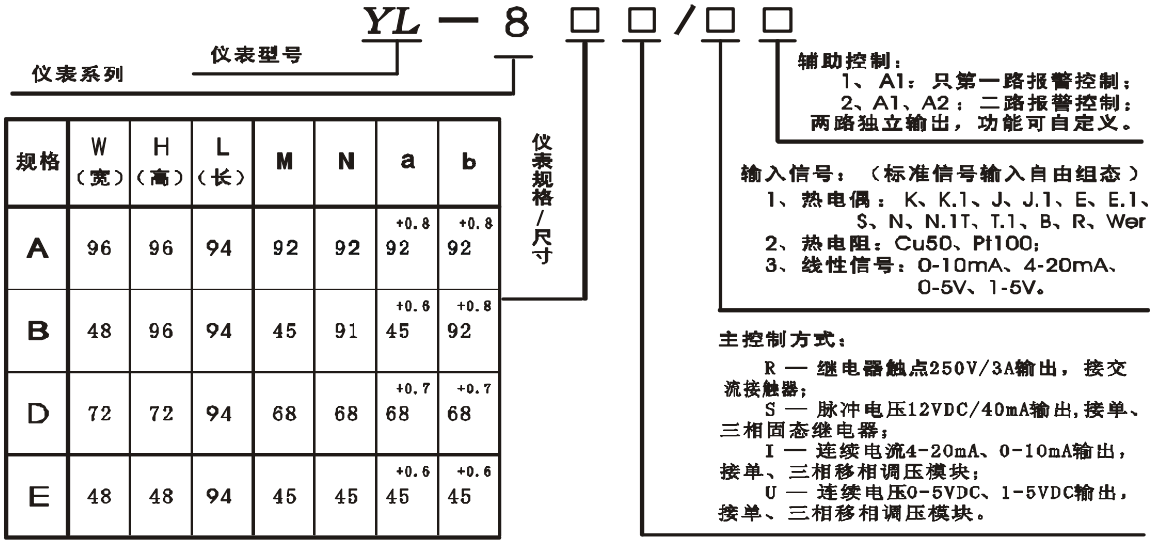


5. ITC Series Number Descriptions

Please verify the products you received with your orders (series number, model, specs), as follows.

ITC product series number has 10 digits such as YL–07AR/12. Each digit shows the following information:

Digit	Possible Values	Descriptions
1st, 2nd	YL	ITC Model
3rd	-	Separator
4th, 5th	08	ITC Series
6th	A to F	Product dimension and specs
	See the table below for its W (wide), H (height), L (length), M, N, a, b for each values of A to F	
7th	R, S, I, U	R=Relay output 250V/3A; S=Impulse voltage output for SSR 12VCD/40mA I=Current output 4-20mA, 0-10mA; U=Voltage output 0-5VDC, 1-5VDC
8th	/	Separator
9th	1,2,3	Input signals: 1=Thermal Couples: K,K1, J,J1, E,E1,S,N,N1,T,T1,B, R, Wer 2=Thermal Resistor: Cu50, PT100 3=Linear signals: 0-10mA, 0-20mA, 4-20mA, 0-5V, 1-5V
10th	1,2	Secondary Controls 1=A1: One channel alarm control 2=A1, A2: two independent alarm channels, any configuration combinations



规格	W（宽）	H（高）	L（长）	M	N	a	b
A	96	96	94	92	92	+0.8 92	+0.8 92
B	48	96	94	45	91	+0.6 45	+0.8 92
D	72	72	94	68	68	+0.7 68	+0.7 68
E	48	48	94	45	45	+0.6 45	+0.6 45

▲ ITC Operation Notes

1.Ambiance requirements for this ITC: pressure:86~105KPa,temperature 0~50℃,Relative humidity 45~ 85%RH.

2.Do not operate ITCs right after dramatic ambiance temperature changes such as moving from cold outdoor to warm indoor.

3.Do not operate ITC in humid, salty and dusty surroundings or near combustible and corrosive materials such as gasoline, chemicals, metal powders.

4.Do not operate ITC on a tremble and unstable structure.

5.When placing multiple ITCs in the same location, keep a distance of 25mm horizontally and 30mm vertically between ITCs.